

DESIGN AND IMPLEMENTATION OF STEAM SUPPLY FOR THE WESTERN GEOPOWER UNIT 1 PROJECT AT THE GEYSERS GEOTHERMAL FIELD, CALIFORNIA

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Abstract

This paper presents the case history of the first significant expansion of the installed power capacity in two decades at The Geysers steam field (California). Western GeoPower Corporation is constructing a 35 MW (net) power plant at The Geysers, where the generation capacity today has declined to about 900 MW from its peak of 1,800 MW in 1987. A 62 MW (gross) MW plant was operated at the Western GeoPower site from 1979-1989 but was shut down because of a rapid decline in well productivity. The development of a new 35 MW plant at this site has become possible because: (a) a long production history and a large amount of resource data are available; (b) a substantial infrastructure exists at the site; and (c) the augmented injection in the reservoir with treated municipal effluent over the last decade has sharply reduced well productivity decline. All four production wells drilled to date for this expansion have proven commercial; three of the four wells have shown much higher productivity than is typical for The Geysers field today, the fourth one being about average. These positive results can be attributed to judicious well targeting and drilling based on the analysis and modeling of the drilling and production histories from the field, significant recovery of the static reservoir pressure over the past decade, and the adoption of an efficient power plant design. The future performance of this project is expected to be attractive because the new plant size is much smaller than the original one, augmented injection over the last decade has sharply reduced the rates of decline in reservoir pressure and well productivity and has diluted the gas content in steam. The technical basis for designing and implementing this expansion program are discussed in the paper.

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